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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,020	02/03/2004	Bangalore A. Nagaraj	122779	2019

39052 7590 01/04/2006

TYLITE INC.  
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EXAMINER
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MCNEIL, JENNIFER C

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 01/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/708,020

Applicant(s)

NAGARAJ ET AL

Examiner

Jennifer C. McNeil

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02/03/04.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darolia et al (US 6,887,595) in view of Subramanian (US 6,716,539). Darolia teaches a thermal barrier coating for a metal substrate comprising a first layer of zirconia stabilized with up to 10 wt% stabilizer, and a second layer of zirconia stabilized with 10-30 wt% stabilizer. The second layer is provided with a thickness greater than the first layer. A bond coating and an alumina layer is present between the substrate and the first and second coatings of zirconia. Regarding the phases of the zirconia layers, the amounts of stabilizers added to the zirconia layers overlaps with that of the instant claims. Specifically, the first layer is preferably stabilized with about 5-8 wt% stabilizer, and the second layer is 10-30 wt%. As these ranges clearly overlap with the instant claims, the stabilization is expected to be similar, resulting in similar phases. Darolia does not specifically teach the presence of microcracks in the second zirconia layer. Subramanian teaches a thermal barrier coating for a turbine engine component substrate, and the coating comprises first and second zirconia layers. The second zirconia layer is formed via air plasma spray and is provided with vertical microcracks or gaps. These gaps provide strain tolerance and resistance against thermal shock damage for the thermal barrier coating. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the thermal barrier coating of Darolia with microcracks like those taught by

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Subramanian, as it is clearly taught that these microcracks provide the benefit of improved strain tolerance and resistance against thermal shock damage during use. Both Darolia and Subramanian teach similar methods of application of the zirconia coatings (APS), and have similar applications (thermal barrier coatings for turbine engine components).

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al (US 6,764,779) in view of Subramanian (US 6,716,539). Liu teaches a thermal barrier coating for a turbine engine component substrate comprising alternating layers of zirconia. The layers have different amounts of stabilizer, wherein the first layer have about 6-8 wt% yttria, and the second layers have about 18-22 wt% yttria. Regarding the phases of the zirconia layers, the amounts of stabilizers added to the zirconia layers overlaps with that of the instant claims. Specifically, the first layer is preferably stabilized with about 6-8 wt% stabilizer, and the second layer is 18-22 wt%. As these ranges clearly overlap with the instant claims, the stabilization is expected to be similar, resulting in similar phases. Liu does not specifically teach the presence of microcracks in the second zirconia layer, and does not teach the second layer or layers being thicker than the first layer or layers. Subramanian teaches a thermal barrier coating for a turbine engine component substrate, and the coating comprises first and second zirconia layers. The second zirconia layer is formed via air plasma spray and is provided with vertical microcracks or gaps. These gaps provide strain tolerance and resistance against thermal shock damage for the thermal barrier coating. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the thermal barrier coating of Liu with microcracks like those taught by Subramanian, as it is clearly taught that these microcracks provide the benefit of improved strain tolerance and resistance against thermal shock damage during use. Both Liu and Subramanian teach similar methods of application of the zirconia

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coatings (APS), and have similar applications (thermal barrier coatings for turbine engine components). Regarding the thickness of the layers, Liu teaches the application of multiple layers (up to 100 total) with each layer having a thickness of 1-50 microns. Liu does not appear to teach that each layer must be provided with the same thickness. Absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art to provide the layers of Liu with a thickness sufficient to perform the desired function of corrosion and oxidation resistance. Variation of the thickness does not appear to provide a contribution over the art of record.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer C. McNeil whose telephone number is 571-272-1540. The examiner can normally be reached on 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jennifer C McNeil  
Primary Examiner